

Space division duplex (SDD) system using smart antenna

ABSTRACT

In this paper, we introduce a new duplexing system, the so-called space division duplex, which can eliminate all kinds of interference. This new duplexing system consists of smart antenna multiple steered narrow beams and orthogonal large area synchronous spread spectrum codes. The purpose is to increase system capacity while maintaining its zero correlation window characteristics. The major types of interference and the properties of large area synchronous codes to combat these are studied. An overview of code division duplexing systems applying these orthogonal smart codes in a wireless environment is analyzed. This analysis shows that the number of orthogonal codes which can be utilized is limited. The proposed solution of a space division duplexing system, with its advantages, is presented. In addition, a code reuse concept is proposed to overcome the limitation of orthogonal codes. Finally, the system performance in term of spectral efficiency and capacity are presented.

Keyword: Space division duplex (SDD); Duplexing systems; Smart antenna; Orthogonal codes; Spectral efficiency